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MICHIGAN

FOREST RESERVE MANUAL

FOR THE

INFORMATION AND USE

OF

FOREST OFFICERS

Approved by the Michigan Forestry Commission.

PREPARED BY
FILIBERT ROTH, Warden.

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WYNKOOP HALLENBECK CRAWFORD CO.,
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GENERAL.

Twenty years ago, a mere day in the life of a State or people, Michigan cut in one year, over 3,600 million feet of White Pine lumber alone and the forests of our State supplied the people of our country clear to Texas, with this choice material, and at the same time called into existence the great wood working industries which have built up our towns and our railways. Our forests supplied our people with an abundance of excellent timber at reasonable prices; our people could afford to build and they did build, and our many towns and farmsteads today testify to the great value of our former forests.

Today the State of Michigan imports lumber; the lumberyard of nearly every town in the State carries Yellow Pine and Cypress from the South and shingles and other materials from the Pacific coast. The consumers of this material, our farmer and townsman, pay not only a large price for the material but, in order to haul this material from 1,000-2,500 miles, part of it over the greatest mountain systems of our land, they pay an additional sum for transportation, often greater than the value of ordinary lumber alone. And all this great waste of money on the part of our people without any good cause, for Michigan has lands in plenty where a good forest growth would supply its people with all it needs and more beside, if only fire and vandal were restricted and thus nature assisted instead of opposed by man.

The bad effects of this condition of affairs are noticed by all close observers. The much needed barn is not built and the farm suffers "because lumber is too high;"

the worker of the town feels that he must crowd into flats and rent houses, because cheap lumber no longer invites him to build a comfortable home of his own. Nor are these the only bad effects of forest destruction. The lumber industry in Michigan represented 129 million dollars in 1890; it only employed 67 million dollars in 1900, so that about half the capital of this industry left the State during these ten years.

Similarly the great wood working industries of our State have ceased to find a sufficient home supply of timber. The Oak which goes into the beautiful and well known product of our furniture factory comes from Arkansas, Tennessee and other distant districts. The enterprising manufacturer is threatened with ruinous competition through men established at these new centers of supply of the principal and bulky raw material of their industry simply because the State of Michigan has failed to look ahead, has failed to husband what it had, failed to protect the forest against useless destruction.

Michigan has an abundance of forest lands but the forests have largely disappeared, and what was once stately forest is now stump waste.

The following table fully illustrates some of the above facts in presenting the condition of agricultural settlement in our State:

Agricultural Classification of the Lands in Michigan. Census 1900.

LAND IN DISTRICT ON AN AVERAGE IS:

District.	Per cent of all land in district.					Remarks.
	Area round numbers million acres.	Settled.	Improved.	Unsettled.	Unimproved.	
1. Forty-two counties in which 45% or over of all the land of any county is settled. The real farm belt of Michigan	17	84	60	16	40	Mostly hardwood lands of great fertility and with a beautiful climate.
2. Ten counties 30–44% of land settled	3.1	34	15	66	85	The unimproved land is largely culled forest and some burned over stump wastes. Mostly fair farm lands but also large poor sandy districts.
3. Sixteen counties 10–29% settled: Alcona, Cheboygan, Chippewa, Clare, Delta, Gladwin, Iosco, Kalkaska, Lake, Menominee, Missaukee, Montmorency, Ogemaw, Otsego, Presque Isle, Wexford	7.3	17	7	83	93	Considerable forests, culled for pine; some very good farm land. Also large areas of cut and burned over pinery lands of light soil and completely denuded of forest growth.
4. Fifteen counties 1–9% settled, includes: Alger, Baraga, Crawford, Dickinson, Gogebic, Houghton, Iron Keweenaw, Luce, Mackinac, Marquette, Ontonagon, Oscoda, Roscommon, Schoolcraft	9.3	5	1	95	99	Includes a great variety of lands in the Northern Peninsula, and large stretches of sandy pinery lands almost entirely denuded of forest cover in the Southern Peninsula.
Entire State	36.8	48	32	52	68	

From the foregoing table we learn two very important facts.

1. That even in the fertile and densely settled farm districts of our State, just as in all older States and the states of Europe, the good sense of the people realizes that not all land is plowland and that even on the farm which might all be put into fields it pays better to keep at least part of the land as woods.

2. That in spite of many years of effort, in spite of the low prices at which our denuded pinery lands have long been offered, their settlement is slow and that it is useless to expect that the light sandy soils of the Michigan pineries are going to settle up at once when many millions of acres of equally good lands along the coast of the Atlantic from Jersey to Texas in a warmer climate, remain unsettled pine woods.

There is no question, but there are large areas of good agricultural lands in every one of our counties and the State will continue to make every reasonable effort to encourage the settlement of these agricultural lands. But it is equally clear that no good can come from leaving millions of acres in an unprotected wasteland condition, where they do no good to town and county; bring no taxes, receive no care and merely discourage settlement by their unsightly, blackened stump waste appearance. The blackened skeletons of the former forest have done more to discourage the real settler than all other agencies combined.

To avoid the enormous waste due to leaving the millions of acres of denuded forest lands in their present idle, nonproductive condition, the State of Michigan has inaugurated the policy of Forest Reserves, and the object of a Forest Reserve is to secure to these much abused lands: Protection and Improvement. In spite of repeated fires, in spite of the fact that after the very soil itself was ruined by this arch enemy of the forest, nature renews her efforts and wherever seed trees exist, nearly every year new generations of trees spring into existence as

tiny sensitive plants. Today millions of these trees are scattered, too thinly, to be sure, over the vast cut and burned over pinery lands and if the fire is prevented from destroying these trees they will in comparatively short time grow into a material of which we need every year more and —produce every year less. Even where man and fire have been too successful and removed all forest cover, so that no seeds, (save the light-winged poplar and birch,) are scattered over the lands, millions of scrub oaks are springing up from sprouts, and will make at least fuel, posts and other small size material if given reasonable protection. And it is chiefly for the purpose of providing this protection that these Forest Reserves were created and it is this protection which forms the foremost duty of every Forest Officer on the Reserve.

Where the denudation has proceeded beyond the point where natural restocking in reasonable time may be expected, the State proposes active improvement of the forest cover by planting. In this way the object of the reserve, protection and improvement of the forest cover, is to be accomplished.

But while thus the protection and improvement of the forest cover is the principal object of the Reserves, yet there are other important benefits which accrue from the creation of these reserves, especially to the people of the towns and counties in which the reserves are located. Generally, we may state them as follows:

THE OBJECTS OF THE FOREST RESERVES.

1. To protect and improve the forest cover and thereby:

(a) Produce a crop of timber on lands which are largely unsuited to other kinds of crops.

(b) Produce from lands now waste and useless, a material of which we use over 1,000 million feet per year in our State alone.

(c) Begin to provide for a home supply of timber which will assure reasonable prices of one of our most important

necessaries and thereby encourage building and general development.

(d) To produce the raw material for one of our most essential industries. To bring back the mill and factory and prevent the departure of those now with us.

(e) To begin checking the ill effects of forest denudation as seen in our streams, where destructive floods alternate with low water which prevent the use of many of our streams and lessen the value of all of them for power and other industrial purposes and thereby rob our State every year of a great amount of wealth.

2. To encourage settlement by lessening the dangers from fire and by restoring to the land the attractive and useful cover.

3. To encourage by direct help and good example, better protection of private lands and thus hasten the good work above outlined by enlisting the co-operation of private owners of land.

4. To regulate the use of these lands and such materials as they now offer, especially to regulate the grazing upon these lands to avoid useless, destructive overgrazing and to guard the interests of the settlers of the immediate districts.

5. To assure to the county and town at least some return in place of regular taxes. The law now provides that the State through its Forestry Commission may contribute to the maintenance of roads and schools in the towns where the Forest Reserves are located.

6. To furnish employment in the protection and care of the forests which beside benefiting the people of the district directly, will do far more good, educationally, in introducing new methods and new ideas concerning the forest. Without this education, without a complete change of sentiment and attitude among the people, without a full and clear understanding of the practice and aims of forestry among the people, all efforts of the State and private holders alike must prove of little value.

Keeping in mind the objects and purposes of the re-

serves and their forests, it is clear that the first and foremost duty of every forest officer is to care for the forest, and every act, every decision he is called upon to make, should be guided by the thought: Will it improve and extend the forest?

REGULATIONS GOVERNING THE STATE FOREST RESERVES.

The following regulations have been prepared and adopted in conformity with the laws of the State, notably the law establishing the State Forest Reserves. They are intended to assure an orderly and equitable conduct of affairs on the Reserves. Since such order and equity are believed necessary to accomplish useful objects of the Reserves, a faithful observance of these regulations, on the part of the people, and a strict interpretation and enforcement of the same on the part of all Forest Officers is essential and expected. It is hoped and believed that the good will and intelligent appreciation of the people concerning the usefulness of the Forest Reserves will co-operate to make these regulations and all arrangements for the proper conduct of these Reserves accomplish the purpose for which they are intended.

I.—SALE, PURCHASE AND EXCHANGE OF LANDS IN THE STATE FOREST RESERVES.

The law provides that the Forestry Commission "shall have power to *lease* or *sell any lands* within such Forestry Reserve ....." It also provides that the Commission "have authority to *purchase such lands* within the limits of said Forestry Reserve *as it may deem advisable* ...."

In general it may be said that the Commission stands ready to sell to any real bonafide farm settler any piece

of real agricultural land within the Reserve, unless such sale would clearly be to the injury of the Reserve by separating or isolating tracts of Reserve lands, such as well established plantations, etc., in such a way that their proper management would be seriously hindered or rendered impracticable.

The method of buying lands from the Forestry Commission is as follows: Any one wishing to buy the land (the applicant) makes a formal application to the Forestry Commission through the Warden of the Forest Reserves. This application together with the report of the Forest Officer and with the recommendation of the Warden is submitted to the Forestry Commission.

If approved, the applicant makes a deposit of $\$\ldots$. for the cost of advertisement. At the expiration of 30 days from date of first advertisement the land shall be sold at the County Seat at the county where the land is located at public auction by the Forest Officer designated for this purpose by the Forestry Commission. If the land is awarded to the applicant as the highest bidder, then the deposit for advertising is accepted as part of the payment for the land; if awarded to some other person it is refunded; but, if the land remains unsold the deposit is forfeited to the State.

In all cases of sales the following holds:

1. No land will be sold at less than $5.00 per acre for the land alone.

2. All timber or other valuable material existing on the land at the time of sale shall be appraised by the Forest Officer, form a separate item in the sale and must be paid for by the purchaser, the price approved by the Forestry Commission to form the minimum price accepted. Thus it becomes necessary that in all such cases the purchaser shall pay at least the minimum ($5.00) for the land plus the minimum (variable with kind and amount of material) for timber and other valuable material upon the land.

The *purchase* of lands is conducted as follows: Any

one wishing to sell his land within the State Forest Reserves makes application to the Forestry Commission through its Warden of Forest Reserves in which he states:

1. Location of land.

2. Character of land, improvements and timber, if any exist.

3. Price asked.

This application must be accompanied by an abstract of title showing that a clean title rests in the applicant.

This application is reported upon by the Forest Officer and is submitted together with report and recommendation of the Warden, to the Forestry Commission. The acceptance of this application by the Commission, a deed to the State and payment of the sum stipulated ends the transaction.

Exchanges of land will be made by the above outlined procedures, the applicant sells his land and purchases the lands derived in exchange in the prescribed manner.

In cases of sale where the total value of land and materials (improvements, timber, etc.) does not exceed $100, the Commission may, if the case appears to justify such deviation, sell without previous advertisement, either at public or private sale.

II.—TAXATION OF RESERVE LANDS.

The law establishing the State Forest Reserves provides that: "No tax shall be levied upon such lands *except for the maintenance of schools and roads*, and no tax shall be imposed upon any of the Forest Reserve lands for the support of any school or the building of any schoolhouse or the building or maintenance of any road which is *not at present in existence*, unless the same shall have been *first approved* in writing *by the Forestry Commission.*" It further says: *"All taxes lawfully levied upon said lands* ..... shall ..... be paid by the State Treasurer to the township treasurer ....."

In substance the law then provides:

1. That taxes on these lands shall be paid by the State to the township in which the lands are located.

2. To obtain this tax the assessment shall be made according to law, and approved by the Commissioner of the Land Office.

3. That the taxes can only be used to maintain school and road.

4. That new schools and new roads require the approval of the Forestry Commission if they are to be aided in their building and maintenance by the tax on Reserve lands.

III.—ROADS AND TRAILS IN STATE FOREST RESERVES.

The care and maintenance of existing highways shall remain with the township according to the laws of the State which provide for this care and maintenance. As stated above the taxes paid by the State shall, in part, be applied to this purpose.

New roads, including extensive changes of existing roads, require the approval of the Forestry Commission in all cases where the new road passes over Reserve land, and also where the funds derived from the taxation of Reserve lands are intended to be used in helping to build and maintain the new road.

The construction of trails over any part of the Reserve lands requires permission from the Forestry Commission.

Whenever any new road or trail is to be constructed the roadmaster or other official in charge of such work, or the person desirous of building such road or trail shall make application to the Forestry Commission through the Warden of Forest Reserves. In this application the following points should be stated explicitly:

1. Location of road; where it starts, through what sections and forties it passes and where it ends. This is usually illustrated by a map, accompanying the application.

2. Kind of road, width of road, and if necessary, right of way, and nature of construction.

3. Amount of corduroy and number of bridges and any other extra structures necessary.

4. Amount and character of timber necessarily cut or destroyed in construction.

5. Name of contractor or person to build the road.

6. Time when it is proposed to begin work and probable time required to finish.

7. Estimated cost of work.

8. Necessity or demand for such road. This, especially, should be fully stated. It should be shown that the road will serve a sufficient number of settlers, will connect important points, not otherwise conveniently connected, etc., to warrant the construction of the road.

Temporary roads to remove timber, etc., require similar application and approval.

Old abandoned, temporary roads and trails, such as old logging roads, etc., the Forest Officers may recommend to have closed, if such closing shall appear necessary for good patrol or otherwise facilitate the care of the forest.

IV.—TELEGRAPH AND TELEPHONE LINES.

Canals, ditches and other similar improvements require the approval of the Forestry Commission if they cross Reserve lands, and no one shall be allowed to begin or proceed with the construction of such improvements until a written permit shall be secured from the Commission.

Application for permission to construct such improvements shall be made in the manner prescribed for roads and trails.

V.—ERECTION OF BUILDINGS.

Persons desiring to erect a building of any kind, large or small, permanent or temporary must obtain permission to do so from the Forestry Commission. In applying for this permission the following points should appear:

1. Name and address of applicant.
2. Occupation of applicant.
3. Number, size and character of buildings. This statement should be quite in detail.
4. Use of buildings if constructed.
5. Necessity or explanation of reason for such buildings.
6. Amount of land desired in connection with the proposed buildings.
7. Period of years for which the land is wanted for this purpose.
8. Price offered by applicant for use of the land and the privileges sought.

Generally permits for privileges of this kind will be granted only where it shall appear perfectly clear that the safety of the forest cover will in nowise suffer through the occupancy of the land for the purpose under consideration.

VI.—TRAVEL OVER THE RESERVES AND CAMPING ON RESERVE LANDS.

All law-abiding people shall be permitted to travel in Forest Reserves for purposes of surveying, to go to and from their own lands or claims, and for pleasure or recreation.

But in every case the person or persons so traveling, camping, etc., must obey the rules established by the Forestry Commission for Forest Reserves, and particularly will they be expected to refrain from doing anything which may result in injury to the forests. See information concerning fires.

VII.—GRAZING IN THE STATE FOREST RESERVES.

The Michigan Forestry Commission is charged, by law, with the duty of protecting and preserving the forest cover and of providing for the reforestation of the de-

nuded lands of the Reserves. To do this effectively it is necessary to protect the forest not only against fire but also against any other injury. Among the agents which injure the forest, grazing by cattle, horses and other live stock is one of the most serious unless properly regulated and restricted.

It is true that cattle may at times do a great deal of good in keeping the crops of grasses and sedges closely eaten off and thus actually assist in the protection of these lands. The removal of the grass prevents the accumulation of dead grass and other readily inflammable material and thus the fire finds less food, is less able to run, and is more easily checked. But there is danger of over-estimating the good effects and of under-estimating the bad effects of grazing. These latter are involved in all cases of grazing. All kinds of stock are obliged to travel and in so doing trample thousands of young trees either killing them outright or crippling the small plants and preventing them from ever growing into valuable timber. But this is not all; during early spring when green feed is still scarce and during dry seasons when feed is short, hard to find and of poor quality, nearly all stock is driven to browsing and in this process the young forest tree, still a bush in size and appearance, is sure to suffer as well as the less valuable willow and other shrub.

This kind of injury is worse with sheep and goats than with cattle and the grazing of sheep and goats should be, for this reason, more restricted. In dealing with grazing the following rules will be observed:

1. A limited amount of grazing will be permitted.

2. The number of head of stock which will be allowed to run on any Reserve will be regulated according to the conditions of the forest cover.

3. Stock will never be allowed to congregate in large numbers to the detriment of the forest trees of the particular vicinity.

4. All persons wishing to graze their stock must obtain

permission to do so. This permission shall be applied for on a regular printed form provided for this purpose. Every applicant shall promise, in his application, to obey the rules and regulations governing the Forest Reserves and shall assist free of charge in protecting the forest cover, and shall help the Forest Officers, especially in preventing and fighting fires on the Reserve lands.

The application together with the report of the Forest Officer and the recommendations of the Warden shall be submitted to the Forestry Commission, where, on approval of the same, permit will be issued.

5. Actual settlers within or living in the vicinity of the Reserve and having an amount of stock not to exceed 20 head of cattle or the equivalent thereof may obtain a permit free of charge, but all persons having a larger number of stock shall be required to pay per head of stock for the grazing privilege.

6. The price to be paid for this privilege will vary according to conditions and will depend especially on the following points:

(a) Whether or not the stock use the Reserve lands as their exclusive pasture, or graze on these lands only part of the time, as is commonly the case with the stock of men living some distance from the Reserve.

(b) Whether the stock use the Reserve lands all or only part of the season.

(c) It will also depend on the grazing value of the particular district or portion of the Reserve, good pasture being worth more than poor pasture.

7. Settlers in and about the Reserve will be given preference in the matter of grazing, and other persons will be allowed the use of range only if there appears to be a sufficient amount of feed over and above what shall be needed for the use of the settlers referred to.

8. Permits for 20 head or less and issued free of charge, shall be obtained from the Warden direct.

9. All stock grazing on the Reserves under regular permit will have the protection of the Forest Ranger or other

protective officers. Just as far as their other duties permit the Rangers will assist the owners of live stock in preventing the injury or loss of stock from any cause, report "strays" and suppress useless dogging or other mischief. Where stock tends to accumulate, however, to the injury of stock and forest cover alike the Ranger will direct their dispersal and a reasonable distribution over the range. Similarly stock will be kept off new plantations, and it is part of the agreement and promise of the applicant, that he and his herders will assist in all reasonable efforts of this kind.

10. In matters of grazing on the Reserves one horse, or five head of sheep or goats will be considered the equivalent of one head of cattle, and all young stock, calves, colts and lambs will be counted as full.

11. The herding of sheep or cattle on the Reserve under pretext of traveling across the Reserve will be considered as ordinary grazing, and will not be allowed without permit. A small number of animals, up to 50 head of cattle, may be driven across the Reserve along the highway without special permit.

VIII.—MARSH HAY, BERRIES AND OTHER MATERIALS.

Any one desiring to cut *Marsh grass* for hay will make application on a regular printed form. Such application with report and recommendations will be submitted in the usual manner. In all cases a written permit shall be necessary and the applicant will be expected to carry on his work of cutting and removing the material in keeping with the promises as presented in his application, especially will he abstain from trespass, and carelessness with fire, and will assist the Forest Officer in every reasonable way in the protection of the Reserve.

The picking of *Berries* will be permitted free of charge. But whenever it shall appear necessary in the proper protection of the Reserve lands against fire, the picking of berries will be regulated and every one engaging in

the work will be required to obtain a permit and will be expected to share in the responsibility for the safety of the particular section assigned to him. Any one guilty of trespass or other violation of the laws and regulations governing the State Forest Reserves will not be permitted to share in the privileges of cutting grass, picking berries or otherwise utilizing any of the materials on the Reserves.

IX.—DISPOSAL OF TIMBER.

Timber will be sold, both live and dead, whenever the removal of such material shall be beneficial or at least not detrimental to the forest cover and therefore in keeping with the objects of the State Forest Reserves as prescribed by law and as outlined in this manual.

Generally all dead timber or timber affected by disease or insects, and all overmature or dying material will be sold and its removal encouraged. Notable exceptions will be made in case of scattering fire-injured pine trees and old trees of any kind which may be of great value to the Reserve in so far as they bear and distribute seed and thus help in restocking the denuded lands with young growth.

Young, thrifty timber which is rapidly growing in quantity and quality alike, will generally be refused unless such material may be taken from dense thickets where a reasonable amount of thinning may not only be helpful, but even necessary to obtain the best results.

In all cases, the good of the forest cover is the first consideration, and all work in the removal of timber must be judged by this final criterion. Even dead timber, such as dead and down Cedar will not be sold unless there shall be assurance that the removal will not injure and destroy young growth to such an extent that the cost is greater than the benefit. In such cases a definite value will be placed on the young growth of at least all more valuable species such as White and Norway Pine,

Cedar, Spruce, Balsam, etc., and this value will be measured by the expense which would have to be incurred in replacing, by actual planting, a stand of young growth as good as the one destroyed, so that trees, properly spaced, may roughly be estimated to have a value of one cent for every foot in height; i. e., a young pine tree three feet high will be estimated at three cents, one 10 feet high at 10 cents, etc., and even trees less than one foot in height will by no means be considered valueless. Where trees stand in dense clumps this valuation, of course will be modified.

In the disposal of timber the following rules will govern:

1. Any one wishing to purchase or obtain timber will make formal application on the printed form provided for this purpose and furnished on request, and no person shall be allowed to cut timber or begin any operation of exploitation until he shall have received a written permit to do so. To cut timber without first obtaining this permit is trespass, and the sending in of an application to secure a shadow of right in the matter will not in anywise alter the case.

2. The application may be sent direct to the Warden or it may be transmitted through the Ranger or Forester.

3. The application will be reported upon by the Forest Officer in the manner prescribed below, and this report together with the recommendations of the Warden will be submitted to the Forestry Commission.

4. If the application shall be approved by the Forestry Commission, a minimum price shall be fixed, the timber advertised in a local paper and sold at public auction by the Forest Officer designated by the Forestry Commission at the County Seat of the County in which the timber, or the greater part of the timber sold, shall be located.

In cases where the stumpage value of the timber shall be 50 dollars or less the advertisement may be omitted.

5. A contract will then be entered into between the purchaser and the Forest Commission, duplicate copies

being signed by both parties, and the receipt of this properly signed contract will serve the purchaser as permit to begin operations. In some cases, a bond will be required for the proper fulfillment of this contract.

6. The cutting will be watched over by the Forest Officer who will also do the scaling in the manner agreed to in the application and contract.

7. Generally the scaling and measuring will be done according to local practice. Logs will be scaled by one of the common scale rules; poles, ties, posts, etc., will be sold by number and grade; shingle timber, pulp wood and fuel will be sold by the cord.

8. All material in every case must be measured and stamped or marked with "State" stamp before it can be removed. Forms No. 2 and 3 for application and contract found in appendix will illustrate this matter more fully.

9. In cases where the total stumpage value of the timber shall be 50 dollars or less, the manner of sale may be simplified, and permit to cut this amount of timber may be obtained from the Warden of Forest Reserves direct.

10. In cases where the dead and down material shall appear to be a menace to the safety of the Reserve and where emergency conditions shall exist the Warden is authorized to grant a permit for a few loads of such material to any one person free of charge, the removal of the material, in such cases, being believed to be of greater value to the safety of the growing forest cover than the dead material itself.

11. Applications for timber will generally be attended to in the order in which they shall be received, but exception to this rule will be made whenever economy and efficiency of the service require such exception.

12. In all cases the work of cutting and moving timber will be stopped if it shall appear that the regulations for any reason whatever, are not followed, and the safety and good of the forest is not sufficiently considered.

13. Usually the application asks for a certain quantity of timber located on a certain description, forty acres,

or lot of ground, the assumption being based on an estimate, that there is this amount of timber on the particular area. If, however, the application calls for 100 M. feet b. m. of timber on lot No. 2, and it shall be found that the estimate was too high, and that only 75 M. feet b. m. of timber can be cut from lot No. 2, the applicant will have *no right* to cut the rest of the timber applied for (25 M. feet in this case) from some other lot. In other words the timber shall be applied for, and sold by *area* and *not by amount* and cutting of timber in violation of this rule will be considered trespass.

14. Any person having trespassed in timber will not be awarded any timber, until his case as trespasser shall be settled.

Such trespass may consist in:

(a) Injury of timber.

(b) Cutting and removing timber without permit.

(c) Cutting on land not applied for, in connection with a timber sale.

(d) Cutting, in cases of sale, timber which has not been marked by the Forest Officer, and yet is of a kind which should be marked before cutting.

15. It is a common mistake on the part of applicants and Forest Officers to suppose that any kind of timber under any circumstances must be sold whenever some one wishes to purchase. Such is not the case. Timber will be sold only:

(a) If its removal shall be rather a benefit than a detriment to the forest cover.

(b) If the applicant shall be willing and able to carry out the work of removal in such manner that the forest will be left in fully as good a condition as he finds it and not in the usual "slash" and "fire-trap" condition in which little young growth is left and this little with hardly any future.

X.—FOREST FIRES.

There is no other agent which has done as much material harm to the State of Michigan as the forest fire. Not only has it destroyed many millions of dollars worth of merchantable timber, but it has prevented completely the billions of saplings and young trees of our extensive forest districts from continuing in their growth and thereby maintaining the supply of timber.

While the damage first mentioned is very great, and is generally the only damage considered, yet there is not a shadow of doubt but this injury and destruction of the immature timber is far more serious than that of the old merchantable material. In destroying the old timber, the fire removed a *ripe crop,* in killing the young growth it destroyed *the forest,* it removed the very possibility of future supplies.

As long as it was supposed that all cut-over lands would settle up at once, it appeared of little moment, and "it helps to clear the land" was the usual excuse; but now that we realize that not all land is likely to be settled or is even fit for immediate settlement it is clear that the State has lost millions of acres of valuable forest.

Nor is this all. The fires have made wastes, and the enterprising, really desirable settler is not fond of wastes. He prefers a good green forest of the heaviest timber to a barren, fire charred, unsightly, uninviting waste, and thus the fires have retarded settlement; they are responsible more than any other cause, for the fact that some of our counties have hardly one per cent of improved land.

To the settler the fires are a menace, they threaten his property; they destroy the range; they keep other people away; they kill the forest and thus prevent the chance of work and chance for a market for his products. The forest fire is the enemy of everybody and everyone interested in the good of his State as a loyal citizen is interested in preventing and in fighting the forest fire.

The laws of the State of Michigan strictly forbid, not

only the malicious burning of woods, but also the careless neglect of fires set for useful purposes, such as camp-fires, fires used in clearing lands, etc.

More in detail:

1. The law provides a *fine of five hundred dollars* and *five years* imprisonment in *State's prison* as the maximum punishment for *willfully* or *maliciously* burning, destroying or injuring wood, timber, or forest growth.

2. To allow by negligence a camp-fire, clearing or other fire to get away and destroy other people's or the State's forest growth, is punishable by a maximum fine of *$1,000 and imprisonment in the county jail for one year.*

3. The law also makes it obligatory on Supervisors, Commissioners of Highways and Justices of the Peace, in cases of forest fires to order all persons liable to work on the highways, to report at the place of fire and assist in fighting the same, and any person refusing to help fight may be fined $50.00.

4. During periods of unusual drouth the Township Board may prohibit setting fires of any kind, and any person disobeying the order of the Township Board in such a case is guilty of misdemeanor and may be punished in a maximum fine of $1,000 and imprisonment for one year.

5. Every person living north of parallel 44 (i. e., north of Town 18 N.) who wishes to set fires for purposes of clearing land, etc., must give notice in writing to all resident owners or occupants of territory immediately adjoining one full day previous to setting such fires, and to neglect this may be punished in a sum of $1,000 and one year's imprisonment.

In so far as the Forest Reserve is occupied ground, being constantly under the actual care of resident Forest Officers it is expected that the nearest Forest Ranger will be notified in writing by any one wishing to set fires on land bordering Reserve lands, in keeping with this act.

The act of 1903, applying to lands north of T. 20 N., provides for a special Forest Commissioner, a Chief Fire Warden, and makes every Supervisor and Mayor a Fire

Warden. It increases the protective features of the fire laws, adds to the penalties and appropriates money (not to exceed $50 per year for any surveyed township) for the purpose of protecting the forest and wild lands against fires.

In establishing the Forest Reserves the State of Michigan means primarily to give protection against fire, and in doing this not only to protect the forest cover of the Reserve lands, but also to assist the settlers of town and county in the protection of all property, farm and forest property alike in the towns and counties in which the Reserves are located. To do this effectively it is necessary that the people of the towns and the Forest Officers co-operate, that the people should never forget that the Forest Ranger is their servant and friend. At the same time there is need of a complete change of sentiment and habit among the people and everybody should help in bringing this about. So far, as every one knows, there has been too much carelessness with fire. Camp-fires are left burning, "oh, it will go out itself," or "what of it, there is no good timber here, and if the fire does run it does no damage." This kind of sentiment and opinion should never exist and should not be tolerated. Again, it has been a common thing to set fire to old buildings; nearly every abandoned house or logging camp has been willfully burned, merely "to see it go." But aside from this wanton destruction there is much to reform in the habits of people. The match and cigar or open pipe combination is so common that no one seems to pay any attention to it. No one should throw a match away until put out; no cigar stump should be thrown away lighted, one second's crushing under the heel puts it out, then why endanger property by neglecting to do so? The open pipe is forbidden in all European forests; it costs hardly anything extra to have a closed pipe and to attend to the ashes when emptying them. All these and many other things are well known to most of our pioneer people and it is not a matter of more knowledge but of change in the

habit which is needed. This change can be accomplished if the farmers and townspeople alike co-operate with the Forest Reserve man, and with the local fire wardens and let the guilty and the careless know that the bad habit is no longer excused, and that public opinion is against any kind of careless and negligent performance in dealing with the arch enemy of the forest of our north counties and of the State as the whole.

To warn people, the Forestry Commission posts up Fire Warning notices, and it is hoped that everybody will leave these little silent agents to do all the good they can. (See form No. 1 in appendix.)

To tear these notices down is willful trespass and will be prosecuted as such.

XI. TRESPASS IN FOREST RESERVES.

In the law establishing Forest Reserves the Michigan Forestry Commission is charged with the duty of "care, custody, control and superintendence of the lands herein or hereafter set apart...." In performing this duty the Commission and its Forest Officers and agents, including every person employed, in any capacity on the Forest Reserve is expected to guard the Reserve, especially the forest cover, against all kinds of injury or damage, and particularly also against trespass of various kinds.

There are different kinds of trespass and only the more common are mentioned in the following enumeration:

1. Trespass in timber. A person commits trespass in timber by:

(a) Cutting and removing timber of any kind, green or dry (live or dead), standing or down, without having a written permit to do so.

(b) Cutting and removing timber on and from land other than the land specified in the permit to cut timber.

(c) Cutting and removing timber after the expiration of the permit.

(d) Cutting, mutilating or injuring in any way, any

kind of forest growth. This includes the careless or mischievous slashing of small trees whether mere plants six inches tall or young saplings 20 feet tall, and it also includes the wanton, useless peeling of trees, such as Spruce and Birch, where beautiful trees are girdled and destroyed merely to get a few square feet of bark, often to be thrown away without even using the same. These practices, especially along highways and along the shores of lake and stream do so much to mar the beauty of the landscape that every well-meaning citizen is expected to assist the Commission in its efforts to prevent such destruction.

In considering the character and damage in trespass, a distinction is made between knowing, willful or malicious trespass on the one hand and unintentional or mistaken trespass on the other.

In general a person who cuts timber on Reserve lands, far from his home, without owning any timber adjoining the lands upon which he cuts may be assumed to know that he has no right to cut and may be considered to have committed trespass knowingly and willfully.

Similarly a person who mutilates trees "just for fun" is a malicious trespasser, for he knows that the trees do not belong to him and that his acts are destructive to the timber. On the other hand, a person cutting timber on his own lands, or timber purchased in a legal manner may by accident cut across the lines, where these are not well marked. This is liable to occur especially where the cutting is done by persons not acquainted with the lay of the land. In such cases the trespass may in truth be due to mistake and therefore unintentional. This statement must not, however, be interpreted to mean that a person under circumstances as above outlined, is always an unintentional trespasser. In all cases of timber exploitation a person is supposed to exercise proper care and diligence to find and to mark the lines bounding his tract of timber and evident neglect in this direction must necessarily make the trespass due to this neglect seem willful.

The laws of Michigan with regard to trespass are quite sufficient, although trespass on State lands is regarded and treated with far more leniency than similar trespass on private lands. While willful trespass on private lands is regarded a *felony* and subject to (where the damage is $25.00 and over,) a maximum punishment of one year in State's prison; the trespass on State lands is regarded a *misdemeanor* and the maximum punishment is *one year in jail and a fine* of $500.

Where suit is brought against the trespasser for the value of material destroyed or removed, the *willful trespasser pays* treble the actual damage; while the "casual or involuntary" trespasser simply pays the actual damage in the case.

To receive material known to have been cut in trespass, to aid or abet trespass makes the person guilty of these acts subject to the same fine and punishment as the trespasser.

Whenever trespass of this kind is discovered, it is stopped at once and all the information obtainable is gathered. It is then reported to the Warden with such recommendations as the case justifies. This report is sumbitted to the Forestry Commission with the recommendations of the Warden, to settle or to prosecute, as the case may be. If concurred in by the Commission, the Secretary of the Commission in his capacity of State Land Commissioner lays the case before the Prosecuting Attorney of the county in which the trespass occurred with request to prosecute.

To enable the Prosecuting Attorney and the court to assist in the proper protection of the Reserves, it is necessary that every effort be made to gather a sufficient amount of substantial evidence. In doing so more hearsay is of no avail, and as far as possible every fact called for in the printed form of report should be established beyond question and doubt. In every case the trespasser should be among the persons interviewed, and he should be given opportunity to state his side of the case, preferably under oath.

2. Trespass in grazing is committed whenever any one grazes stock on the Reserve lands without permit. The rights of the State of Michigan in its own lands are exactly the same as the rights of a farmer in his farm holdings. Just as the farmer can not allow everybody to graze in his fields and meadows so the State, of necessity, must regulate grazing on lands where it proposes to grow a crop of timber. In considering this trespass the damage will always be regarded and judged as an injury to forest growth, particularly to the young growing plants and the forest tree in its plant or bush size and form.

3. Unlawful occupancy of land and inclosure of the same. On land belonging to the Reserve, it is trespass to fence the land or otherwise permanently occupy the same without written permit from the Commission.

4. Miscellaneous trespass, such as doing the following without permit:

Building roads, trails, ditches, canals, telephone and telegraph lines, or erecting buildings of any kind, for any purpose on any part of the Reserves. All kinds of trespass should be stopped by the Forest Officer and promptly reported irrespective of any damage which may have been caused.

DUTIES OF FOREST OFFICERS.

The work of Forest Officers, Foresters and Rangers may be enumerated as follows:

1. Protective duty, guarding against fire and trespass, fighting fires and stopping trespass, as well as assisting the State authorities in the protection of game.

2. Care and propagation of the forest. Every Forest Officer is expected to familiarize himself thoroughly with and to assist in seedbed and nursery work and the methods of restocking the denuded lands. He is also expected to promote and improve the growth of the forest cover by a careful, painstaking supervision of all cases of timber exploitation.

3. Special work, such as arises in connection with graz-

ing of stock; cutting of marsh hay; gathering berries; construction of roads, trails and bridges; leasing of lands and erection of improvements thereon; with sales, purchases and exchanges of lands and other cases requiring special investigation and report.

4. Permanent improvements carried on by the Reserve force, such as making surveys of land and timber, establishment and care of headquarters and other similar improvements under the immediate care of the Reserve force.

In this connection it should be stated emphatically that Forest Rangers and Foresters do not have the authority to grant timber, grazing, etc., permits and the public should not find fault with the Officers and the Reserves if they fail to obtain permits and privileges through these officers. The Forestry Commission alone grants privileges, except in the few instances above stated where minor cases have for reasons of expediting business been delegated to the Warden of Forest Reserves.

Considering the duties of Officers more in detail, the following should be kept in mind.

I.—PREVENTING AND FIGHTING FIRES.

It is expected that every Ranger and other Forest Officer shall be constantly on the lookout for fires.

Fire Notices.—An ample supply of fire warning posters will be furnished at all times, and it is imperative that the Reserves be thoroughly "posted" with these useful notices. The fact that, in a few rare cases, malicious persons destroy them, is no excuse for neglecting this important preventive effort. In many cases the warning can be combined with some useful information, such as a signboard to indicate the Reserve line, limits of districts, or excluded parts in grazing ranges, etc. The destruction of the notices is willful trespass.

Camp Fires.—Forest Officers should inform transients and others concerning the rules and regulations governing camp and other fires. This should be done cheerfully

and politely; and an officer who is unable to talk with persons who, from ignorance concerning the rules, or from lack of experience in camping, appear to do wrong, without losing his temper or without using improper language, fails to that extent in one of his principal duties. In cases where inexperienced persons build a fire against a large rotten log merely to cook a cup of coffee, or where a fire is built in a mass of dry duff, dead leaves, branches etc., and where the work of putting out such a fire is beyond ordinary effort, a Forest Officer should call their attention to such mistake and instruct them in the proper way of building and handling fires. The two main points in this connection are always:

(a) Do not start a fire where it will be difficult to put it out.

(b) Never leave a fire without putting it out. This is law. The puerile desire to see a fine balsam or spruce burn and show like a huge candle in the night, which has so often been expressed and carried out, must, of course, never be tolerated. It is malicious burning, and may bring a fine of $1,000.

Lighting Fires.—Fires from this source are not rare, especially in dry seasons, and it is necessary after every electric storm to make a special effort to locate and extinguish any such fires before they are well under way.

Fighting Fires.—When once a fire has spread over an acre or more, especially on difficult ground where a large amount of dead and down material makes it a real hot fire, the matter is frequently beyond the possibilities of one Ranger alone. In such cases it is often best to seek for help.

In fighting fires of this kind the character and conditions of the woods, the weather, and even the time of day have so much to do with the case that a set of general directions has little value, and the experience and good judgment of the Ranger mean everything.

Generally, it may be said that the proper tools to fight the fire are the shovel, mattock, ax and rake.

For this reason the Ranger should always carry at least shovel and ax during all the dangerous season, so that he is never unarmed against this arch enemy of the woods.

In humid, heavy timber the fire usually travels slowly, and a few men, if persistent, can keep it in check by trenching, though they can never extinguish it, and must therefore watch it until a rain helps them out.

In dry, open pine woods the fire travels faster, and it is often best to go some distance and hunt the most open and clean ground, trench, and *back fire* from there.

In handling back fires great care is required to avoid the useless burning of forest.

In all kinds of fires, the night or the early morning hours are the best time to work, whenever any choice of time exists; for nearly all forest fires die down more or less during the cool of the night, and then flare up again during the heat of the day.

Generally, we may say:

(a) Protect the valuable timber rather than the brush or waste.

(b) Never leave a fire unless driven out, or until it is put out.

(c) Young sapling thickets suffer more than old mature timber.

(d) A surface fire in open pine woods, though not dangerous, does great harm in destroying the seedling growth.

(e) A fire rushes up hill, but crosses a crest slowly, and is more or less retarded in traveling down. Therefore, if possible, use the crest of the ridge and the bottom as your lines of attack.

(f) A good trail, a road, a stream, an open park, check or "bring down" the fire. Use them whenever possible.

(g) A bit of thinking often saves labor and makes work successful. Ill-planned efforts suggested by haste and excitement rarely lead to success.

Expenses.—While the State is willing and anxious to prevent and fight fires, and is willing to go to considerable expense therefor, it is unreasonable to suppose that

an unlimited amount of money is to be devoted to this effort. Experience has proved conclusively that in most cases a reasonable effort is all that is justified, and that a fire which cannot be controlled by 20 to 40 men will run away from 100 or even more men, since heat and smoke in such cases make the direct fight an impossibility.

Unusual expenditures will not be tolerated. They are unnecessary, wasteful, and even mischievous. For it is claimed, in not a few cases, that the fire was started and thrived because of the opportunity for a job. In and about nearly every Reserve it is possible to enlist the co-operation of the better citizens, and thus to have such an agreement that in time of need there can be had a sufficient number of men, and men of the proper kind. A crowd of men hastily gathered about the taverns, etc., of a town, without organization, without interest, and without experience, is usually a poor makeshift with which to battle a fire.

Accounts.—The payment of persons in cases of fires will be made in the same manner as the payment for ordinary labor. Effort will be made to have this payment made at once as soon as the service terminates.

Persons enjoying privileges of any kind in connection with the Forest Reserves are expected to render a reasonable amount of assistance in cases of fire without additional compensation.

II.—GUARDING AGAINST TRESPASS.

Every kind of trespass, but particularly trespass in timber, must be prevented, or reported and stopped.

Whenever a Ranger or Forester passes by a place where timber cutting is in progress, whether under permit or not, he should, if possible, take the time to examine the cutting. He should see that the timber, if cut under permit, is marked; that the lines are blazed and marked; that the logs being hauled away are stamped; in general,

that the cutting is done according to the rules of the Commission set forth in this Manual.

If the cutting is without permit, the Ranger should ascertain by what authority the timber is being cut; and if the authority is sufficient he should ascertain if the lines limiting the area are clear, and that no cutting is being done across such lines.

If he finds that the cutting is without permit or without authority, or finds irregularities or violation of the rules, he should at once collect the facts as required by the form of report on trespass in timber and prepare such a report. This report he will transmit to the Forester. If the case appears to be unquestionably a trespass, the Ranger will notify the persons to stop cutting and hauling, taking care to note time of day, date, and place of such notice, giving such notice, if possible, only in presence of a witness.

Where the case requires prompt action the Ranger or Forester will seize all material cut under trespass and invoke such assistance as appears necessary.

If the nature of the case warrants such procedure, the trespasser shall be asked to settle, and his offer of settlement can accompany the report. In all offers of this kind a *certified check* for the amount offered should accompany the report.

Forest Officers will note the above enumeration of trespasses and will guard against all of them. In no case should the officer pass any work, etc., without ascertaining whether or not it is done under proper authority. In reporting trespass other than in timber, the form prescribed for report on trespass in timber can be followed and adapted.

III.—CARE AND PROPAGATION OF THE FOREST.

In dealing with the regular timber sales the Forester will never lose sight of the main objects of the Reserve, and therefore never recommend the sale of any material,

where its removal will do harm to the forest cover and its future.

In handling an application for the purchase of timber the following points and directions should be observed:

If, after examining a tract applied for, the Forest Officer shall decide to recommend the sale, he shall explain to the applicant all the requirements which will be demanded of him by the regulations, adding such as he may think necessary in the instance at hand, and these shall be agreed to in the signed application. To avoid misunderstanding later, it is important that all points concerning the proposed cutting be discussed fully before the application is submitted. Following are a number which must be included in all applications and the Forest Officer is expected to add others when advisable:

1. To what minimum diameter on the stump will cutting be allowed?

2. How many seed trees per acre shall be left?

3. To what diameter in the tops must trees be utilized?

4. Should the brush be piled, and in what manner?

5. Will any extra work, such as cleaning up down stuff not cut by the purchaser or burning brush, etc., be required of him?

6. How high are the stumps to be (usually not higher than the tree is thick, and in valuable stuff not above 18 inches)?

7. Should felling be done with saws?

8. Will hewing be allowed except at skidways and openings?

9. Will cutting be allowed throughout the year?

10. What material may be used for skidways, road material, and camps, and shall it be paid for?

11. Where will applicant be allowed to locate camps, roads, dams, etc.?

In cases where the application is for "dead" or dry material it must be understood that this includes only wood, standing or down, which is actually dead, and in no case trees which are apparently dying. In the case

of evergreen species, all trees having any green leaves are classed as living timber. Since deciduous species, such as tamarack and most hard woods, have no foliage in winter, special attention must be given during this season. Trees dead at the top and green below, generally called spike topped trees, are classed as living, and must never be cut under dead-timber permits.

If an agreement shall be reached in the matter the case will be reported upon by the Forest Officer on the prescribed printed forms, copies of which appear in the appendix.

Unless part of such information has been previously secured, the examination of the tract by the Forest Officer must include:

1. Surveying, mapping, and blazing out the lot or lots on which the cutting will be located.

2. Locating definitely enough to permit estimate, description, and locating on map, of cutting area itself.

3. Measuring and estimating of timber on proposed cutting area, and on entire block when practicable.

4. Description of lot and cutting area.

5. Recommendations concerning proposed sale, with reasons for them. These should embrace such points as the probable effect on the future composition and reproduction of the forest; the condition of the timber in so far as it affects the policy of holding it for advance in price; the need for the timber applied for; the possibility or difficulty of getting it in some better place; the reliability of the applicant, and the price which should be obtained. The latter point is one of great importance, and should be decided, not by general precedent in the region but by the actual value of the timber as determined by its character, difficulty to log, and distance from market. Timber on a gentle slope and near a mill or drivable stream may be worth more than twice that made inaccessible by lack of roads or distance. The Forest Officer should determine the cost of marketing all material and

recommend prices which will make it approximately equally desirable.

In the marking, cutting and scaling the following is to be noted:

If the application shall be approved, the Forester or Ranger (with assistance if necessary) will mark at once all trees to be cut. This is imperative in all cases involving living timber. Where only dead timber is purchased, and there is no danger of confounding it with timber in various stages of injury or disease, the marking of individual trees will be dispensed with. In such instances the Forest Officer may simply blaze and mark the boundary of the cutting area and instruct the purchaser in the manner of cutting.

The marking of standing timber must be done with the "State" stamping hammer, and all trees must be marked near the ground in order that the stumps may afford positive evidence of the marking. Where snow may conceal such marking from the cutters, it will be necessary to mark each tree at a point several feet from the ground also.

Cutting in any case will not begin until the Forester is informed of the fact that the timber has been awarded to the applicant or highest bidder.

From the time that cutting shall begin the Ranger or person entrusted with the scaling of the material shall make a report on the progress of the cutting. This report shall be made on the regular printed form prescribed for this purpose and submitted on the 15th and at the end of each calendar month, to the Forester of the district and by him transmitted to the Warden's office.

It shall be the duty of the Ranger to see that the cutting shall be confined to the least possible area and not distributed here and there over the entire tract; also, that, so far as reasonable, all branches of the logging operations keep pace with each other. In no instance will the brush piling be allowed to fall behind the manu-

facture and removal of logs, ties, and other material. The ground must be cleared as fast as the work proceeds.

The manner of piling brush may be varied according to conditions, but the object is always to insure ready and clean burning, as soon as possible, with the least injury to standing timber and seedlings. The piles should be compact and large enough to kindle easily and burn clean without repiling. When possible, they should not be nearer than 15 feet from standing green trees or dead trees having many branches or a covering of moss which might be ignited. Where the density of the standing timber makes the above rule impracticable, openings should be made by cutting, or, if this is not feasible, the piling should be near the least valuable trees and where there is the least danger of the fire spreading. All chunks, knotty sections, or other unutilized portions of trees, as well as the branches, must be piled, and as much of such material as possible should be piled together to insure clean burning. Where the contract does not oblige the purchaser to utilize the trees into the extreme tops, all the remaining portions must be cut up and piled or dragged full size into openings where large piles may be burned safely.

The above instructions will be followed, as far as they apply, in all cases where timber is cut or disposed of. The fact that only a few trees, dry stubs, a few loads of dry material are under consideration does not in any way change the case. A few minutes work on the ground will suffice in such cases to supply the information for a complete and satisfactory report, and thus enable an orderly conduct of business.

In estimating and scaling in connection with timber sales the following points should be considered and the work should always be done in a careful workmanlike manner:

Since all timber is sold on actual scale after cutting, a simple estimate of the timber, as distinct from caliper measurement will be permitted in most cases. In making

the estimates, the entire area of the lot may be covered by going over the land along lines 20 rods or less apart, or the area may not be entirely covered and mere sample tracts estimated. The former is much the better method in large timber, especially where the timber is irregular or scattered. The sample methods are justified in dense thickets of small timber, such as cedar thickets in swamps, etc., especially where much dead and down material has also to be accounted for. Of sample methods only the following two should be employed, so that a certain degree of uniformity in the work will be attained:

(a) The "circle method," either by quarter-acre or full acre circles where the estimator places himself in the center of a circle whose radius in case of full acre circle is 40 yards and counts and tallies all trees within this circle. This is an easy and very satisfactory method. The beginner will do well to carry a staff and place it at the center of the circle and from this pace out to make sure that he does not include material outside of the circle. In using this method it is necessary to take the sample area or circle not by choice, but along certain definite lines and at fixed and uniform distances apart. In covering a 40 acre tract the lines may be 20 rods apart and the circles also 20 rods apart along these lines so that 16 circles are estimated for the 40 acres and thus 40% of the area covered by the estimate if full acre circles are used and 10% if the circles are one-quarter of an acre each. A common mistake of the beginner is to "fudge," i. e., to go a little beyond the fixed 20 rods, because the spot has little or no timber. This is wrong and makes the estimate perfectly useless. The value and reliability of the estimate lies in the strict adherence to the system chosen.

(b) The "strip method," where the estimator counts and estimates all trees along his path on a strip two or four rods wide. By using a four-rod strip and closing the tally every 40 rods, each tally sheet contains the results for one acre. Here again the strips are taken along defin-

ite lines. This also is a very good and satisfactory method and in some kinds of timber deserves preference over the circle method.

Whichever method is used the map and report should indicate the method employed, thus for instance the report should state:

"Circle method; full acre circle, 20 rods apart on lines 20 rods apart; 40% of area covered."

In any case the estimate should not be mere guess, but should be based on an actual tally of the trees, divided by kinds and recorded in diameter classes, usually differing by two inches.

These tally sheets should be preserved and serve as basis of the report. Wherever the case justifies a more careful method, it will be found that a regular caliper measurement is but little more costly and far more satisfactory than the ocular estimate.

Where this method is employed two calipermen and one tally man work through the timber in a four-rod strip, covering either the entire area or a definite per cent thereof.

Scaling and Stamping.—Larger pieces should all be scaled separately. Hasty methods of averaging diameters or length or both can not be allowed. Ties and tie pieces are simply counted. Posts and poles are counted, but must first be classified by length and upper diameter. Shingle timber, pulp wood and fuel are measured by the cord, but the length of the material is specified. Square timber is reckoned as full like sawn timber.

In making allowance for decay, crook and other defect, the local custom may be followed. Where controversy arises in important cases, the judgment of the Forester of the district prevails. "Flat" logs, i. e. with elliptical cross-section are scaled on the average diameter; material, hewn on two sides is scaled on the diameter parallel to the hewn faces. In "long lengths" a scale will be required such that no log over 18 feet receives but one measurement. For instance: A 20-foot log 14 inches at upper

diameter should be treated as one 10-foot log 14 inches, and one 10-foot log 15 inches diameter, a taper of one inch per 10 foot length being generally assumed.

When scaled, each stick of saw logs, timbers, ties, posts, poles, or piles must be stamped with the State mark on at least one end, and on both when possible. Cord material, such as wood or bolts, must be stamped at both top and bottom of piles and at least 12 pieces in each cord must be stamped.

PLANTING OF TREES.

The planting of trees or the restocking of denuded areas is one of the duties imposed by law on the Forestry Commission.

For this reason every Forest Officer should acquaint himself with the methods employed for this purpose, he should learn to sow, and tend nursery, to plant and care for plantations as they are made on these "slash" lands.

In addition he should learn the value of seed trees and of sprouts, of "improvement-cutting" and "thinning" and should use every minute of his time when not otherwise engaged in furthering the growth of the forest. Every day he meets, on his rounds, patches of ground where a fine reproduction deserves special care and attention, where hundreds of young trees still in their "bush" stage are laboring under cripples or inferior kinds with little hope of getting on and where a few days' work would save more well established valuable young trees than could be set out at ten times the expense involved in giving these established trees the necessary help. A little good sense and an industrious spirit will suggest a multitude of things to do and an enthusiastic Forest Officer will find that the forest, like the farm is never without want of help and is ever ready to repay well every effort made in its behalf.

So far the work of reforestation has but just begun. Over 50,000 trees have been planted and a seed bed and

nursery is established in District No. 1 of the Roscommon Reserves. In conformity with the law, it is the intention to continue this work, enlarge the facilities, and assure greater economy and better success by growing the plant-stock in the vicinity where it is to be used.

These plantations and all other important or specially valuable or promising tracts of young growth will receive special care, and will be surrounded by fire lines and thus be assured better protection than could otherwise be furnished.

IV.—SPECIAL WORK.

The grazing of stock, cutting of hay, construction of roads and trails and the many similar cases require special investigation and report of the Forest Officer and it is expected that he will act promptly and with perfect frankness and fairness. He should be just, polite and helpful, and should always endeavor to earn the respect and good will of the people of the district, and enlist thereby their hearty co-operation in the protection and improvement of the forest.

V.—PERMANENT IMPROVEMENTS.

In the forest survey and classification of lands prescribed by the law establishing the Reserves, the present division of lands, i. e., the U. S. Land Office system will be adhered to; its landmarks will be left undisturbed and the designation of Town, Range, and Section retained. It will be the duty of all Forest Officers, at every opportunity to re-establish and maintain the original landmarks and also such landmarks as will be established in carrying on the forest survey. In this latter the section lines will be re-blazed, and quarter and eighth posts will be established on all east and west lines. The Section will be divided into eight lots, each quarter section forming two 80-acre lots, these lots to be numbered 1-8 and

thus the description considerably simplified, since the longer description for instance of "E ½ of S E ¼ is replaced by lot 8." This simplification will prevent mistakes and at the same time does not interfere in the use of the original designation where this appears preferable.

Other improvements, such as the erection of fire lines, shelter camps, trails, will be taken up as time permits, and the necessity for such work appears. In all cases of this kind and especially if an outlay of money or extra help is required, the Ranger or Forester first submits a plan of the work, its scope, estimated expense as well as the reasons for undertaking the work at the particular time and place. No work of any importance should be undertaken or even provision made for the same before such a plan has been submitted and approved by the Warden.

VI. PROTECTION OF GAME.

In the protection of game the Forest Officer shall act as an assistant to the game wardens of the State. It shall be his duty to discover violators of the game laws and help to stop their depredations.

Reports on violations of the game laws shall be made to the Warden and to the local or State game warden.

VII.—PATROL OF RESERVE.

In his patrol of the Reserve the Ranger should not only visit a few convenient points at irregular intervals but he should so arrange his work that every section shall be visited and sufficiently often that the Ranger shall be able to keep in mind the character of the forest cover, its condition and needs. To do this properly it is necessary that a network of trails be gradually established, and that these trails follow as far as possible, section lines and other landmarks so that the Ranger may know at every moment just what portion of his beat

or district he has about him. For this reason the patrol should be combined with regular land-looker work, the Ranger should devote part of his time to locating and marking section corners and lines until the regular survey shall be completed, and even where this is done, he should maintain and improve the landmarks, corners, etc., reblaze obscured lines, improve old and build new trails, clean out bad spots in fire lines and do such work as can well be combined with patrol and where a single person can really accomplish marked good.

At all times the Ranger should keep close watch of all that is going on within the Reserve, whether on private or Reserve lands. He should know all the settlers, and the conditions of the settlement; he should visit all lumber camps, large or small, and should know at any time whether these camps are in operation, about how many men are at work and should anticipate any difficulties or trespass. Where the Ranger is in doubt and fears complications of any kind, either in matters of trespass or of fires, as in case of clearing lands, he should see the person in charge and in a friendly helpful spirit and manner, he should state his fears or his side of the case and endeavor to persuade the person to carry on the work in a way which will preclude all difficulty and remove any danger from fire or other injury. Where this remonstrance and persuasion fails he shall report the case at once to the Forester with such recommendations as he sees fit to make.

VIII.—THE FOREST OFFICER AND THE PUBLIC.

As servant of the people the Forest Officer should, at all times, be ready to give information as to the condition of affairs on the Reserve, the methods pursued, the results attained and the plans and policy followed. At the same time he should be discreet, and should, especially refrain from any statement as to what the Commission would or would not permit or approve, since such officious

anticipation of the action of his superiors is certain to lead to trouble and bring the officer and his work in disrepute and confusion.

IX.—REPORTS.

A proper management of the Reserves demands that all conditions, all work, and all occurrences which affect the Reserve in any way should be properly reported and recorded. Without a fairly complete knowledge of the character of land and timber it is impossible to regulate properly the utilization of the Reserve.

In nearly all cases a mere general information is of very little value. For instance, an application for timber can not possibly be properly considered simply upon a showing that there exists an abundance of timber in the Reserve, or even in the particular township. The conditions and amount of timber on the particular quarter section is what is needed.

Accordingly, every Forest Officer should learn to report, and, in order to report well, should learn to observe and record fully and correctly. Clearness, completeness, and brevity should be combined in reporting as far as possible; long dissertations and reference to irrelevant matters must be avoided.

The different reports are classified as follows:

RANGERS' REPORTS.

1. *Report of Service.*—This is a weekly report to the Warden of the Reserves transmitted through the Forester of the district. It is made out on a regular printed form, and contains primarily the items of service or work rendered by the Ranger during the week. Special information, request for assistance or other recommendations accompany this report.

2. *Reports on Regular and Special Work.*—These are reports in connection with sales of timber, with grazing,

applications of any kind transmitted by the Ranger. All reports of this kind are made according to the regular forms, and on regular blanks, where such are furnished. In making the report the Ranger should never have more than one subject on a sheet of paper. Thus, he should not report an application for grazing on the same sheet with an application for timber, but should use a separate sheet for each report. The reports may be made with a hard pencil or in ink, but where rain is likely to spoil a manuscript in ink the pencil is preferred.

REPORTS OF THE FORESTER.

1. *Weekly Reports.*—These are brief statements of the progress of the work in hand, together with a tabulated statement of the number of days' labor performed on the different kinds of work, the expense which this represents and the amount of work accomplished as far as this is feasible.

In this enumeration the time of the Rangers and Forester is not included and only the extra help is recorded. For the present the different kinds of work are classified as follows:

(a) Protection including the fighting of fires.

(b) Reforestation.

(c) Survey of lands.

(d) Disposition of timber.

(e) Permanent improvements, such as roads, trails, Ranger cabins, etc.

(f) Miscellaneous work, such as extra work in connection with exchange of lands, grazing and special applications of any kind.

2. *Monthly Reports.*—These are more extensive statements of the condition of affairs the work performed, work in hand and work planned for the coming month, together with such requisitions for purchase of materials, and recommendations for new work to be undertaken as the conditions of the Reserve appear to demand.

The monthly report is accompanied by reports on fires, scale reports in cases of timber sales and reports on grazing, condition of range, distribution of stock, etc.

EMPLOYMENT AND OFFICIAL STANDING OF FOREST OFFICERS.

1.—WARDEN OF FOREST RESERVES.

The Warden is appointed by the Forestry Commission for a term of four years, but may be removed at any time. No person is eligible unless in good health, able bodied, thirty years of age or over, a graduate of some college of repute, with an amount of training in forestry sufficient to pass the U. S. Cicil Service examination for Field Assistant, or its equivalent, and at least four years' experience in the direction and office routine of actual forestry work.

The Warden is the direct representative and agent of the Forestry Commission, and has authority to:

1. Recommend the employment and dismissal of Rangers and Foresters.

2. Employ help, purchase material and incur expenses necessary to carry on the work on the Reserve as far as approved or ordered by the Commission.

3. Plan the work on the Reserve.

4. Report and recommend to the Commission any change in personnel, methods and policy of managing the Forest Reserves.

5. Issue permits in sale of timber and other material where the value of the material does not exceed $50.00 in any one case; the judgment of this value to be left with the Warden, subject to revision by the Forestry Commission.

6. Issue permits for the grazing of live stock in cases

where the permit is issued free of charge or where the value of the grazing privilege does not exceed $20.00 in any one case or for any one applicant.

7. In cases of flagrant violations of official behavior, the Warden may suspend any subordinate Forest Officer, and, if the officer shall be dismissed subsequently his pay will terminate with the date of suspension, and not of dismissal.

The duties of the Warden are:

1. Plan and direct the work on the Forest Reserves. In doing so the Warden submits from time to time plans and estimates of work and in no case is he permitted to undertake expenditures without specific written approval and authority of the Forestry Commission. The Warden is expected to visit the Reserves as often as the business of the Reserves requires, and is held responsible for an honest, economic, and efficient conduct of this business. All Forest Officers and other employees on Reserves are under order of and directly responsible to the Warden.

2. Keep a complete record of the business of the Forest Reserves. Until further order this record will involve the following distinct items and cases:

(a) Lands, purchase, and sale of lands.
(b) Protection, Rangers and Foresters' reports.
(c) Survey of lands.
(d) Reforestation.
(e) Disposal of timber and other materials.
(f) Grazing of live stock.
(g) Trespass.
(h) Fires.
(i) Expenses, classified by:
Administration, protection, reforestation, survey, equipment, permanent improvements.
(j) Income, classified by the various sources.
(k) Plans and authority for different kinds of work undertaken on the Reserves.

3. The Warden attends to all applications, recommendations and accounts coming from the people or Forest

Officers, and submits applications and accounts with his recommendations to the Forestry Commission.

4. The Warden shall report to the Forestry Commission from time to time the condition of the Reserves and all special occurrences or cases of sufficient importance. At the end of each quarter of the calendar year, he shall report all permits issued by him and all sales of materials, not otherwise coming before the Commission.

On or before the first day of October of each year the Warden shall submit his yearly report, covering the past fiscal year.

The Warden is not a bonded officer, and has no authority to accept money for any privilege, material or concession. Such payments, whether checks, money orders or otherwise, should all be made to the Michigan Forestry Commission or its Secretary.

The salary of the Warden is $1,000 per year.

II.—THE FORESTER.

1. Foresters will be employed from time to time as the needs for their services arise.

2. The applicant for this position must be able bodied, of robust health, good habits, of good repute and character, a graduate of some college of repute; must have had a full course of training in forestry, covering two years of study and at least two seasons of actual active field work in pursuit of some line of forestry work.

He may be required to pass an examination and will always be expected to submit satisfactory recommendations.

3. The Forester shall be appointed by the Forestry Commission upon the recommendation of the Warden and shall hold his position subject to the pleasure of the Commission.

4. The salary of the Forester will vary with the man and the work and shall be fixed by the Commission.

5. The Forester shall be the superior officer in his dis-

trict; have charge of men and equipment but have no authority to issue permits, grant privileges, sell material of any kind or enter any agreement which should bind the Forestry Commission in any way whatever.

6. The Forester shall carry out the orders and plans assigned to him by the Warden, and will be responsible for an efficient, economical conduct of affairs and satisfactory work.

7. The Forester will be expected to be in the field daily, direct, in person, all important work as far as this is possible; direct and assist the Rangers in their work; keep time of all help; issue pay orders in cases where this method of accounting is permitted or prescribed and receive the materials purchased for work in his district. He shall be responsible for the equipment and materials entrusted to him.

8. The Forester shall submit plans and estimates of work; make recommendations for new work, for the purchase of lands and equipment for the employment of extra help, and suggest changes of methods and improvements.

9. In purchasing materials and in the employment of men the following rules will hold:

The Forester will make a requisition for the purchase of the material, this requisition shall be sent to the Warden and receive his approval and thereby become a valid order.

The Forester can employ men and teams only on direct written order of the Warden.

Both the above rules or requirements may be waived in extraordinary cases, such as fire, emergencies in times of planting, etc., and may also be deviated from at express order of the Warden.

10. The Forester will transmit and report on all applications, adding his recommendations.

11. He will transmit the reports of the Rangers, and submit both weekly and monthly reports of his own.

12. The Forester will keep records of:

(a) Expenses incurred in his district. This does not include salaries of Rangers and Foresters.

(b) Requisitions issued.

(c) Help employed, men and teams, i. e., regular time book.

(d) Pay orders issued.

13. The Forester will also keep at his headquarters copies of:

(a) Maps of district.

(b) Forest description of district.

(c) List of lands, in districts, including all lands properly included within the boundaries of his district.

III.—FOREST RANGERS.

1. The Rangers will be appointed by the Forestry Commission on recommendations of the Warden.

2. The salary of the Ranger will be fixed by the Commission, and his term of office at the pleasure of the Commission. Long and efficient service will entitle the Ranger to promotion in salary.

3. Applicants for this position must be 21 years of age or over, robust, able bodied, of good habits; properly recommended. Experienced woodsmen and local men are given preference.

4. The Ranger shall be a protective officer, but will assist in other work as the circumstances and time permit.

The foremost duty of the Ranger shall be to patrol the beat assigned to him, and he will be held responsible for the safety, from all injury, of the property intrusted to his care.

5. The Ranger will receive, and transmit, and report on applications, and his recommendations will be generally necessary before issue of permit.

6. The Ranger will submit a regular weekly report of service to which he will add such suggestions and recom-

mendations as may appear necessary for the safety and good of the forest.

7. In cases of fire or extraordinary danger the Ranger may employ assistance but must notify at once the Forester of the district to which his beat belongs.

8. Trespass and fire shall be both specially examined and made subject of special report on regular prescribed form.

9. The Ranger will have no authority to grant privileges of any kind, to sell or purchase materials or enter any agreement which should appear binding upon the Forestry Commission, except in emergency cases as above specified. The acceptance by the Ranger of money, in any form, in connection with any transaction or affairs of the Forest Reserve, save his own, is forbidden.

APPENDIX.

FOREST RESERVE LAW.

AN ACT to create a forestry reserve, to provide for its maintenance, management and regulation, by restoring for sale or homestead entry, lands heretofore reserved in certain counties in this State, to make an appropriation therefor, and to provide for a tax to meet the same.

The People of the State of Michigan enact:

Section 1. All delinquent state tax, homestead, swamp and primary school lands now belonging or which shall hereafter be added to and belong to the State in towns twenty-one north, range three and four west; the north half of town number twenty-four north, range four west, and the south half of town number twenty-five north, range four west, are hereby withdrawn from sale and entry, set apart for the creation of a forestry reserve, and for that purpose placed under the control of the Michigan Forestry Commission created by act number two hundred twenty-seven of the public acts of eighteen hundred ninety-nine. It shall be the duty of said Michigan Forestry Commission, first, to investigate and determine what part or portion of the lands belonging to the State, thus withdrawn from sale and entry and set aside, it will be for the best interests of the State and public to retain and devote to the purpose of forestry, having regard both to the soil and natural characteristics and conditions of said lands and their relative fitness for cultivation and forestry, and also the location of the various descriptions of the same with respect to each other, so that the lands to be devoted to such forestry reserve shall be composed of contiguous territory, or territory as nearly contiguous as possible, so as to render practicable and desirable, the establishment and maintenance of forestry reserves embracing the same. Second, to have care, custody, control and superintendence of the lands herein or hereafter set apart for or becoming a part of the forestry reserve, and to provide for the reforestation of the denuded lands so set apart and belonging to the State, by planting and

preserving forest trees, establishing and maintaining fire lines and a system of fire patrol in the forestry reserve thus created.

Section 2. The forestry commission shall have power to appoint a forestry warden who shall hold office for the *term of four years* from the first day of January in the year in which appointed, unless sooner removed by the forestry commission. The said forestry warden shall receive an annual salary of not to exceed one thousand dollars, payable in the same manner as the salaries of state officers are now paid, and he shall be subject to the orders and directions of the said forestry commission, which shall prescribe his powers and duties and he shall have general charge, control and supervision of all deputy wardens or other persons appointed or employed for the performance of duties or service in respect to forestry lands or forest fires. The said forestry warden may appoint, upon recommendation of the forestry commission, a sufficient number of competent persons as forestry wardens, to hold office at the pleasure of the said commission, who shall be entitled to receive a sum not to exceed two dollars per day for each day actually and necessarily spent under the direction of the chief warden in the discharge of duties under this act. Said compensations to be paid by the Auditor General on the approval of the president and secretary of the said forestry commission.

Section 3. The said forestry commission shall have power to cut, remove or sell (or to sell to any person with the power to cut, sell or remove, upon such terms and under such conditions and restrictions as it may deem advisable), any trees, timber or other forest products upon or derived from the said lands so set apart as forestry reserve lands, and shall have power to *lease or sell any lands* within such forestry reserve, the lease or deed therefor to be executed for and on behalf of the state by the commissioner of the state land office. The said forestry commission shall likewise have authority to purchase such lands within the limits of said forestry reserve as it may deem advisable in order to connect and render contiguous separate tracts. All moneys received by or payable to the said forestry commission on account of or arising from revenues from said lands, or from any other source, shall be paid to and received by the *secretary of said commission*, whose official bond as commissioner of the state land office shall be responsible therefor, and shall be paid by him into the state treasury and the receipt of the State Treasurer, countersigned by the Auditor General, shall be taken therefor.

Section 4. All forestry reserve lands set aside under or pursuant to the provisions of this act shall be *exempt from taxation*, except as herein otherwise provided. Said lands shall be assessed

in the same manner as are the similar lands of individuals situated within the townships in which the same are situated. Within ten days after the final meeting of the board of review of each township, the supervisor of such township shall file in the office of the Commissioner of the State Land Office at Lansing, a certified copy of the assessment roll of his township, with the several assessments completed thereon and reviewed, said roll to specify which of the lands appearing thereon are forestry reserve lands and the valuation placed upon each description, and also the lands owned by private individuals, and the valuation of such lands; the several matters appearing in said assessment roll to be verified by the supervisor on oath. No assessment of forestry reserve lands shall be valid, nor shall any tax be spread thereon, until such assessment is approved by the Commissioner of the State Land Office, such approval to be attached to and become a part of the original assessment roll of the township. No tax shall be levied upon such lands except for the maintenance of schools and roads and no tax shall be imposed upon any of the forestry reserve lands for the support of any school or the building of any school-house or the building or maintenance of any road which is not at present in existence, unless the same shall have been first approved in writing by the forestry commission. All taxes lawfully levied upon said lands in accordance with the provisions of this section shall, in each year, be paid by the State Treasurer to the township treasurer of the township in which the same are situate, by a warrant in favor of the said township, said warrant to be issued upon the filing with the Auditor General by the said forestry commission of a certificate that such taxes have been levied in accordance with the provisions of this act. No fee shall be allowed to the township treasurer or other official for the collection of such tax or taxes.

Section 5. For the purpose of carrying out the provisions of this act, the Auditor General shall add to and incorporate in the state tax for the year nineteen hundred three, and each year thereafter, the sum of seven thousand five hundred dollars. Such sum shall be immediately available upon the passage of this act, and shall be paid to the said commission upon the warrant of the Auditor General, in the same manner in which such appropriations are usually paid, and shall be governed in all respects by the accounting laws of the state.

Section 6. The lands hereby set aside shall be subject to the protection of the provision of the several acts relating to the cutting, removing or destroying in any manner whatsoever, timber

on said lands. This act shall be known and may be cited for any purpose in legal proceedings or otherwise, as the forestry reserve act.

Section 7. All other lands heretofore reserved from sale or homestead entry in Roscommon and Crawford counties either by act number two hundred twenty-seven of the session laws of eighteen hundred ninety-nine, or concurrent resolution number seventeen of the session laws of nineteen hundred one, are hereby restored for sale or homestead entry as provided for other state lands.

Form No. 1.

FOREST FIRES.

WARNING.

STATE FORESTRY COMMISSION,
Lansing, Michigan, July 15, 1904.

Fires run over large areas of forest and cut over lands in our State every year. In doing so the fires:—

Destroy large amounts of valuable timber;
Destroy entirely all the young growth of trees, which otherwise would grow into valuable timber;
Destroy the humus material of the soil and thereby make soil much poorer;
Destroy the feed, grass and sedges, which might otherwise be of much value to the settler;
Destroy the natural beauty of the land and make the country look like a desert.

By doing these several kinds of damages, the fires have done more to hinder and actually prevent settlement and the development of our northern counties than all other agencies combined.

The laws of Michigan:

Forbid setting fire to the woods, and also,

Forbid leaving fires, camp fires and others without extinguishing the same.

The law provides a maximum punishment of:

A fine of $1,000 and imprisonment for one year; and, in case of malicious burning of forests, by imprisonment for five years.

These lands, forming a part of the State Forest Reserves, are regularly patrolled by forest rangers, whose duty it is to see to the enforcement of the law and thus to protect the property of State and settler alike. It is to every settler's interest, therefore, to assist in this work of protection.

These notices are posted for the *good of the people*, of every settler, of farmer and townsman alike, and it is expected that the people will therefore see to it that these notices stay in place, to do as much good as possible.

CHAS. W. GARFIELD,
Pres. Mich. Forestry Commission.

Form No. 2.

MICHIGAN STATE FORESTRY RESERVES.

APPLICATION FOR TIMBER, HAY, ETC.

Name of applicant.....

Address .....

Date ....., 190....

I, the undersigned, respectfully request permission to.....
.....the following:
(Cut, gather, remove.)
Kind of material applied for.....
(Hay, green, dry timber, etc.)
.....
Amount of material .....
(Tons of hay; cords, etc. of timber.)
.....
Location of material: T..... N; R.....; Sec.....
Town of .....; County of.....
Price offered .....
.....
Where material will be taken to .....
The material will be.....
(Used by applicant, cut or taken.)
.....
(For market.)

If this application is granted, I, the undersigned, promise to obey cheerfully all laws and rules governing Forest Reserves, and especially:

1. Commit no trespass of any kind, and never to assist trespass by purchasing material obtained in trespass or otherwise.

2. To do all in my power to assist the forest officers in the protection of the forest, especially against fire.

3. To pay the Forestry Commission for any and all damages sustained by reason of my use and occupancy of the Forest Reserve, regardless of cause or circumstances under which such damage may occur.

In case that I am permitted to cut the timber applied for I promise also to:

1. Use the material only for the purpose and at the place stated in my application, namely, for.....
....
at .....

2. Cut no timber until it is assigned to me.

3. Cut no timber outside of the area assigned to me.

4. Cut only timber properly marked by the forest officer.

5. Conduct the cutting and removal of the material in a careful manner, and to injure as little as possible any of the remaining timber and young growth.

6. Leave no trees "lodged" and leave no logs or other material on the cutting area.

7. Leave stumps no higher than.....inches.

8. Use the shaft of the trees down to.....inches diameter.

9. Work up cordwood down to.....inches in diameter.

10. Drag out the tops into openings ready for burning or....
....

11. Lop the tops and pile the brush, as directed in the case..
....

12. Do no hewing except at skidways or assigned spots.

13. Cut only.....material, and to cut all sound dead material, both standing and down.

14. Pile all material ready for measurement.

15. Remove no material before it is measured and stamped.

16. Cut and remove the material before.....day of ....., when this permit shall terminate.

Violation of Nos. 1, 2, 3 and 15 of the above rules will render the applicant liable to suit for trespass, and the violation of *any* of the rules will be liable to deprive him of further "free-use" privileges.

.....
(Name of applicant.)

REPORT AND RECOMMENDATION OF FOREST OFFICER.

1. *Brief descriptions of woods where this timber is to be taken.

2. Does the forest officer know the applicant?.....

3. Is there danger of collusion between applicant and others of obtaining timber illegally?.....

4. Will the removal of this material endanger the material left behind? .....;
is there danger of bad or careless exploitation leading to the destruction of much young growth?.....

*To be used only in cases of free use or where the value is less than $10.000.

5. I do.....approve this application for the following reasons:
.....
.....
.....,
Forest Ranger.

6. I do.....approve this application.....
.....
.....,
Forester.

Form No. 3.

MICHIGAN STATE FORESTRY RESERVES.

CONTRACT FOR THE SALE OF TIMBER.

Lansing, Michigan, ..., 190...

This contract is hereby entered into by and between Mr.....
.....
of .....
party of the first part and the *Michigan Forestry Commission*, party of the second part, for the purchase of certain timber on the Michigan State Forestry Reserves, based upon the bid of the said .....
for said timber, submitted in pursuance of a duly advertised proposal to sell said timber, which bid has been accepted by the Michigan Forestry Commission, said bid and advertisement being made a part of this contract.

Amount and kind of timber involved in this contract:

All of the .....
(Fill out thus: All of the dry cedar, etc., located on certain areas.)
located on certain areas assigned and estimated to contain.....
.....
(Here state cords, M. feet, B. M. of material, etc.)
.....

Location of the above timber:

No. of acres covered by this contract.....;
in lots .....; Secs. .....;
T.....N; R.....

In consideration of the sale of this to me, I.....
.....
promise to pay the Michigan Forestry Commission at Lansing,

Michigan, the sum of.....dollars ($.....), being at the rate of $.....
....
(Here state values per M. ft., per cord, per piece, etc.)
and to pay this money.....
(In advance, in monthly payments, etc.)
....
due credit being given for the sums heretofore deposited with said commission in connection with this sale and purchase.

And I further agree and promise to conduct the work of cutting and removing said timber in accordance with the following specifications:

1. I will comply strictly with the laws and regulations governing forest reserves.

2. Submit all timber and wood to measurement by the forest officer before the same is removed.

3. Pay in advance for all timber before cutting the same.

4. To cut only timber on the area agreed upon and blazed and marked, and not to cut any of the live trees bounding this area.

5. To leave no logs, ties, lagging or other material in the woods, and to pay double the agreed price for any material thus left in the woods.

6. To pay for all material used in shanties, buildings in the construction of roads, skidways or any other improvement.

7. To cut all timber marked for me by the forest officer, this marked timber to involve the following kinds, grades and sizes
....

8. Of unmarked timber cut only the following kinds, as here agreed upon .....
....
(Dry timber, poles, etc., assigned by area and not separately marked.)

9. To leave no trees lodged in process of felling but avoid felling trees into unmarked timber and thereby necessitating the cutting of much unmarked timber, or causing damage to such trees.

10. All felling to be with.....
(Axe, saw or both.)

11. No stumps to be left higher than.....inches.

12. Shaft of trees to be used to a minimum top diameter of .....inches, and all limbs to be used to a minimum diameter of.....inches.

13. The tops and brush resulting from the cutting of this timber to be.....
(Piled, lopped, piled and burned.)

.....

and no pile of brush to be piled or burned nearer to living trees than.....feet.

14. Hewing of ties and timber, and peeling of poles and posts

.....

(Not allowed, allowed only in assigned places.)

.....

15. Dead material .....

(Here state if all is to be cut and disposed of, or only the round, merchantable, only that of certain kinds, etc.)

.....

.....

.....

16. Building of camps only at.....

17. Construction of roads of.....with not to exceed .....yards (in length) and all secondary roads to be not over.....feet in width and not closer to each other than .....yards. This entire matter to be approved by the Forest Officer, and any damage from the cutting of unnecessary roads to be paid for at double the agreed value of the material.

18. Construction of dams and other accessory improvements..

.....

.....

19. Scaling to be done by the Forest Officer at least once every .....days or oftener.

20. Scale rule to be used.....

and the following special point in the measurement of the material are agreed to in this contract.....

(Upper end, inside bark, average

.....

diameter; scale for every.....ft.)

.....

(Shorten log for scale; crook in inches per length; scale in open.)

.....

(Scale fresh; scale of dead timber; poles, posts, ties per piece.)

.....

(Classify by size or kind; measure by cord; shingle stuff; cordwood.)

.....

(to be.....feet long; measurement of defect, etc.)

.....

21. No piling of material on piles already scaled or received, or any other act which would render difficult or impossible an accurate measurement of the material.

22. The cutting to be done at a rate of about.....
....
(M. ft. or cords per day or month.)

23. All material purchased in this case is to be removed before
....., 190...

Signed at .....
....., 190...

By.....

Signed .....
(For the Michigan Forestry Commission.)

Form No. 4.

MICHIGAN STATE FORESTRY RESERVES.

BOND FOR PRIVILEGES AND TIMBER CUTTING IN FOREST RESERVES.

Know all Men by These Presents, That we.....
....
as principal, and.....
and .....
as sureties, are held and firmly bound unto the Michigan Forestry Commission in the penal sum of.....
dollars ($.....), for the payment of which sum to the Michigan Forestry Commission at Lansing, Michigan, within thirty days from date of demand on us for such payment by the Michigan Forestry Commission the use and benefit of the State of Michigan, we bind ourselves, our heirs and legal representatives by these presents; subject, however, to the following conditions, viz.: Whereas, the above bounden.....
has been, on his petition therefor and in pursuance of the statute in such case made and provided, permitted by the Michigan Forestry Commission to enter upon the lands of the Michigan State Forestry Reserves, within the limits of the.....
Forest Reserve, in the county of.....of
..... and
to .....
....
....
....
....
....
....

.....
.....
.....

and has executed his contract of even date with this obligation, wherein he promises and engages to make full compliance with the laws and rules and regulations governing Forest Reserves now or hereafter in force during the continuance of said contract, and to obey all lawful orders and directions of the officers in charge of said Forest Reserve, and specially to pay the State of Michigan for any and all damage sustained by reason of his use and occupation of said forest reserve regardless of the cause or circumstances under which such damage may occur, and to do every act and submit to every requirement necessary to the promotion of the interests involved in the creation of the forestry reserve. Now, if the said..... shall pay the State of Michigan for any and all damages sustained as aforesaid, and shall well and truly do and perform all the requirements of such contract on his part to be done and performed and shall observe and comply with the aforesaid laws and rules and regulations in such case made and provided, then this obligation to be void, otherwise the same is to be and remain in full force and effect.

Dated at....., 190...

.....
.....
.....

State of.....
.....County. } ss.

On this.....day of ....., 190.. before the undersigned, a.....in and for said county. personally came..... and .....to me personally known to be the identical persons named and who signed the foregoing bond, and each acknowledged that he signed and executed said bond voluntarily for the uses and purposes therein specified.

Witness my hand and official seal the date last above written.

(Seal.)

.....
.....

State of.....
.....County. } ss.

..... and .....
being duly sworn, each for himself, says that he is a citizen of the United States and a resident of.....; that he signed the above bond as one of the sureties thereon; that he is worth the sum of..... in property in the.....of his residence over and above all legal liabilities and exemptions, and that he has property therein subject to sale or execution worth the sum of.....

.....

.....

.....

Subscribed in my presence by..... and ....., and by each of them sworn to before me this.....day of....., 190...

Witness my hand and official seal the date last above written.

(Seal.) .....

.....

Form No. 5.

STUB.

Name.....
Address.....
Date of month.....190..
Kind of material.....
.....
Amount of material.....
.....
Location of material.....
Town.....
County.....
T.....N; R.....
Sect.....
Lot.....
Price paid.....
To be removed by.....
.....190..
Mail to be used.....
.....
.....

MICHIGAN FORESTRY RESERVES.

PERMIT.

Lansing Mich., ...190..

Permit is hereby granted to.....
of....., to cut and remove from the lands of the State Forest Reserves in Town....., County....., the following:

Kind of material.....
.....
Amount of material.....
.....
Location of material, T.....N; R.....; Sect.....; Lot.....
Price to be paid for material .....
The material to be removed before.....190..; and to be taken to.....and to be .....
(Used by Applicant, cut for sale, etc.)

This permit is issued on the conditions agreed to by the applicant on his application and printed on back of this permit.

.....
Warden.

Conditions of Permit. Applicant agrees to obey all laws and rules concerning Forestry Reserves.

Commit and encourage no trespass.

Assist Forest Officers in protecting Reserve.

Pay for any damages due to occupancy of Reserve by applicant. Also to:

1. Use the material only for the purpose and at the place stated above.

2. Cut no timber until it is assigned to him.

3. Cut no timber outside of the area assigned to him.

4. Cut only timber properly marked by the Forest Officer.

5. Conduct the cutting and removal of the material in a careful manner, and to injure as little as possible any of the remaining timber and young growth.

6. Leave no trees "lodged," and leave no logs or other material on the cutting area.

7. Leave stumps no higher than.....inches.

8. Use the shaft of the trees down to.....inches diameter.

9. Work up cordwood down to.....inches diameter.

10. Drag out the tops into openings ready for burning or.....

11. Lop the tops and pile the brush, as directed in the case..

12. Do no hewing except at skidways or assigned spots.

13. Cut only.....material, and to cut all sound dead material, both standing and down.

14. Pile all material ready for measurement.

15. Remove no material before it is measured and stamped.

16. Cut and remove the material before.....day of ....., when this permit shall terminate.

Violation of Nos. 1, 2, 3, and 15 of the above rules will render the applicant liable to suit for trespass, and the violation of *any* of the rules will be liable to deprive him of further "free use" privileges.

Form No. 6.

MICHIGAN STATE FORESTRY RESERVES.

APPLICATION FOR GRAZING.

Name of applicant.....
Address .....

To the Michigan Forestry Commission:

I, the undersigned, respectfully request the permit to graze on the lands of the Michigan State Forestry Reserves in Sections ....., T....., Range....., in town of ....., county of..... the following stock:

Cattle.....; horses.....; sheep or goats.....

This stock to graze from.....to..... .....of the season of 190..., and to graze..... .....on the lands of the Reserve.

(Entirely or part of time.)

For this privilege I offer to pay the sum of $.....or $..... per head for this one season.

If permit is issued to me I promise to obey all rules governing the State Forest Reserve; to assist myself, and through my agents, free of charge, as far as is reasonably compatible with my other duties and affairs, in protecting the forest cover against all injury, and especially to help the Forest Officers in preventing and fighting fires.

Signed.....

I do approve this application.

.....

Ranger.

I do approve this application.

.....

Forester.

Form No. 7.

STUB.

Name.....

Address.....

Date of issue .....190..

Applied .....190..

No. head.....190..

of .....

of.....

to graze part, all the time on reserve in T.....N.. range.....

....., Sec..... from .....

.....to..... .....

MICHIGAN FORESTRY RESERVES.

GRAZING PERMIT.

Lansing, Mich..... .....190..

Permit is hereby issued

to .....

of .....

to graze..... head of..... .....

.. .. " " .....

.. .. " " .....

on the lands of the Michigan Forestry Reserves, in T.....N., R....., Sec. .....in town....., county .....

during the season of 190....from.....to.....

This permit is issued in consideration of payment of $.....and on the conditions agreed to by the applicant in his request for this permit, in which he especially promises to obey all rules and regulations, to assist free of all charge in protecting the forest cover against all injury.

....

Warden.

.....

Commission.

Form No. 8.

MICHIGAN STATE FORESTRY RESERVES.

DESCRIPTION AND ESTIMATE OF TIMBER.

(Used in all cases where value greater than $10.00.)

County.....

Date....., 190...

1. Location of timber applied for: T..... ..N; R.....; Sec.....; Lot.....; date or survey.....

2. Character of land, typography, soil drainage.....

.....

.....

3. Number of acres covered by application.....

4. Character of forest, species, proportion of those, density, age, thrift, reproduction, etc.....

.....

.....

.....

.....

.....

5. *Additional information *concerning the forest cover, methods to be followed in logging, likelihood of damage to forest, means to restock, etc*.....

.....

.....

ESTIMATE OF TIMBER.

Method of survey used.....

Proportion of area covered by survey.....

.....

Number of Trees.

.....

Diameters b. h.	Kinds of timber. Keep green and dry timber separate, also trees making only cordwood.	
		Cordwood.
O. bark.		Hard. Soft.

* If more space is required use back of page.

....
.....
.....
.....
.....
.....
.....
.....
.....
....
Condition
(Defect, etc.) .....
Totals .....
Logs
M. ft. b. m. .....
Cords .....
Poles .....
Tie pieces .....
Posts .....
....

Value of this timber at railway or landing.....
....
Probable cost of getting this timber:
1. Cut .....
2. Skidded .....
3. Hauled to railway or landing.....
Further remarks .....
....
....
....

The above is a true statement to the best of my belief and knowledge and is based on an actual and careful survey of the forest of the tract herein named.

.....
Forest Officer.

Examined by me and believed to be correct.

.....
Forester.

Form No. 9.

MICHIGAN STATE FORESTRY RESERVE.

SCALE REPORT.

County of ....., ..., 190..

Case No. ..... Name of Purchaser.....

The following amount of timber was scaled or measured by me in connection with this case during the .....week ending ....., 190..

Logs	M. ft. b. m.	.....	.....
"		.....	.....
"		.....	.....
"		.....	.....
"		.....	.....
Cords (Pulp, cedar bolts, etc.)	Cords	.....	.....
		.....	.....
Poles	Pieces	.....	.....
Tie Pieces	"	.....	.....
Posts	"	.....	.....
		.....	.....
		.....	.....
		.....	.....

1. Has all material been measured and stamped before removal from the lands?.....

2. Has all material been marked before cutting according to instructions? .....

3. Is the purchaser doing clean work as he proceeds or is he picking over the land, leaving spots uncut, etc.?.....

.....

4. Is the brush being piled?.....

5. Is the cutting in progress at this date?.....

6. Is there much injury to young growth?.....

7. Has purchaser failed in any way to observe the terms of

his contract or the instructions of the Forest Officer?.....

.....

8. Suggestions of Forest Officer in this case.....

.....

The above is a true statement to the best of my knowledge and based on personal examination.

.....

Forest Officer.

Examined by:

.....

Forester.

Form No. 10.

MICHIGAN STATE FORESTRY RESERVES.

REPORT OF TIMBER TRESPASS.

County of ....., ..., 190..

1. Name of trespasser.....
2. Address of trespasser.....
3. His occupation .....
4. Has trespasser timber on his own land or claim?.....
5. Location of trespass: T.....N; R.....; Sect.....; Lot.....
6. Kind of trespass:
   Did trespasser simply cut timber?.....
   Did he cut and remove timber?.....
   Did he merely mutilate or destroy timber?.....
7. Did trespasser claim to be on the land by any authority or right, if so, what claim did he make?.....

.....

(Did he claim to be sent there by others; claim to own the land.)

.....

(Claim to own neighboring lands, etc.)

8. Kind of material cut.....

.....

9. Amount of material cut.....

.....

10. When was trespass committed?.....

(Date found cutting, hauling,

.....

etc. If hearsay, let it be so stated.)

11. Who did the cutting?.....
(Name of men and address.)
.....
12. Who did the skidding?.....
.....
13. Who hauled the timber?.....
.....
14. Where was it hauled to?.....
.....
15. Where was it sawed or further manufactured?.....
.....
16. Is there any of the cut material on the cutting area at present, if so, how much?.....
.....
17. Was any of the material cut in trespass found at other places, along road, at bank, at railway, at saw mill? If so, where and how much?.....
.....
18. Has any of the material been seized? If so, how much?..
.....
19. How is this material guarded at present?.....
.....
20. Where was the material cut in trespass used, and what was it used for?.....
21. Was any of this material sold? If so, to whom?.....
.....
22. If sold, how much of the material was delivered to purchaser? .....
23. Did the purchaser make this purchase innocently or with knowledge of the trespass?.....
Give reasons for your statement.....
.....
24. What is the value of the material?
a. On the stump.....
b. After being cut, hewn, etc.....
.....
c. At sawmill .....
d. At nearest lumber yard or market point.....
.....
25. When did Forest Officer examine the land trespassed upon?
.....
26. What did the Forest Officer himself find?.....
.....
.....
.....

27. Was trespass wilful or unintentional? State carefully all reasons for thinking it wilful or not.....
.....
.....
28. Is trespasser financially responsible?.....
29. Has he offered to settle?.....
30. Action recommended by Forest Officer.....
.....
31. Names and addresses of witnesses and brief of their testimony .....
.....
.....
.....
.....
32. *Did this trespass involve the destruction of any young growth? If so, how many young trees are estimated to have been destroyed?*.....and what was their approximate size? .....

Signed.....

Forest Officer.

Examined by:

.....

Forester.

Form No. 11.

MICHIGAN STATE FORESTRY RESERVES.

REPORT OF RANGER.

Submitted weekly.

The following is a true statement of the work performed by me and the observations made by me during the week ending ....., 190..

Monday:

Tuesday:

Wednesday:

Thursday:

Friday:

Saturday:

Signed.....
Forest Ranger.

Form No 12.

MICHIGAN STATE FORESTRY RESERVES.

REPORT ON FIRES.

County ....., ..., 190..

(Note.—Every fire is reported separately on this form.)

Fires are divided into three classes:

Class 1. Small fires, such as abandoned camp fires, etc., covering but a few rods of ground.

Class 2. Small fires, covering not over five acres of land, and checked by Forest Officer without extra help or expense.

Class 3. All larger fires, and especially all fires requiring extra help and expense.

1. Date of fire....., 190..
2. Location of fire: Lots.....; Secs.....; T.....N; R..... .....
3. Fire was of class.....
4. Number of acres burned over.....
5. Number of acres of real forest burned over..... .....
6. Amount of timber destroyed:
   a. Probable number of trees killed having a diameter b. h. of:
      4 inches or less.....
      4-8 inches .....
      8-12 inches .....
      Over 12 inches .....
   b. Merchantable material destroyed:
      Feet b. m. of..... .....ft.
      ....
      ....
      ....
   c. Cords of fuel wood.....
      Poles of ....pieces.
      Posts of ....pieces.
7. Cause of fire..... .....
8. The fire was discovered by..... ....., on....., 190..
9. The fire was brought to the notice of the Forest Officer, date ....

10. Fighting the fire was begun.....
11. Work was finished .....
12. Number of extra men used.....
13. Cost of fire:
    Extra help ..... days work, $.....
    Material, provisions, etc.
14. Remarks .....

....

Sign.....

Ranger.

.....

Forester.

Form No. 13.

MICHIGAN STATE FOREST RESERVES.

REPORT OF FORESTER.

County..... Date..... 190..

To the Warden of Forest Reserves:

The following is a true statement and report of the affairs of my district for the week ending ....., 190..

CLASS OF WORK.	Day's Work.		Expense (Excluding Board).
	Men.	Teams.	
Reforestation: Plantations			$
Nursery Work			
Protection, (including fires and excluding Forest Officers)			
Survey of Lands			
Improvements (State kind.)			
Miscellaneous Work			
Goods received during week (total value)			
Total			

Work accomplished .....

.....

.....

.....

.....

.....

.....

Forester.

Form No. 14.

Requisition No.....

Date.....190....

Mr.....

Address.....

Items.....

.....

.....

.....

.....

.....

.....

Approved by Warden.....

.....190....

No.....

MICHIGAN STATE FOREST RESERVES.

REQUISITION.

Lansing.....190....

Mr.....

Address.....

Please furnish the following articles and charge to the Michigan Forestry Commission:

.....

.....

.....

.....

.....

Warden.

Form No. 15.

Pay order..... No..... No.....

Date..... 190..

Amount $..... Amount $.....

In favor of .....

Name.....

Address.....

For.....

.....

.....

.....

To be paid by.....

.....

.....

MICHIGAN STATE FOREST RESERVE.

PAY ORDER.

County.....

Date.....190..

Mr.....

Address.....

Please Pay to.....

Name.....

Address.....

The sum of.....dollars

for.....

.....

.....

.....

.....

Forester.

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